



LEICA
PHOTOGRAPHY

Cover by Ernst Haas

Seen by the gifted photographer on a recent October weekend in Connecticut and captured via the Leicaflex SL.

Adam Arkin, Pasadena, California, 1961 by Alan Arkin



LEICA PHOTOGRAPHY

Volume 23 Number 2 1970

EDITORIAL BOARD

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SHOWPLACE

B. A. King

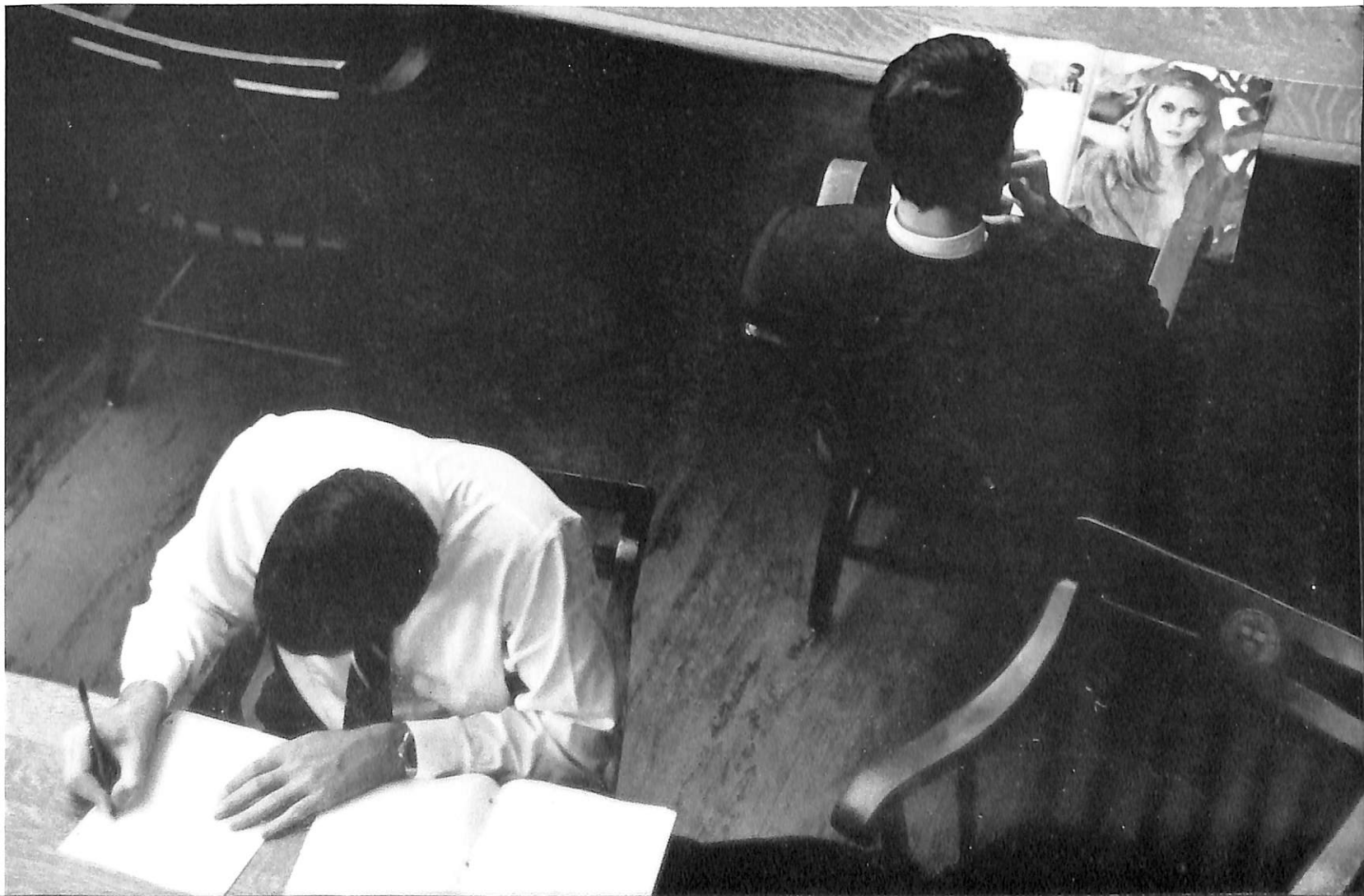
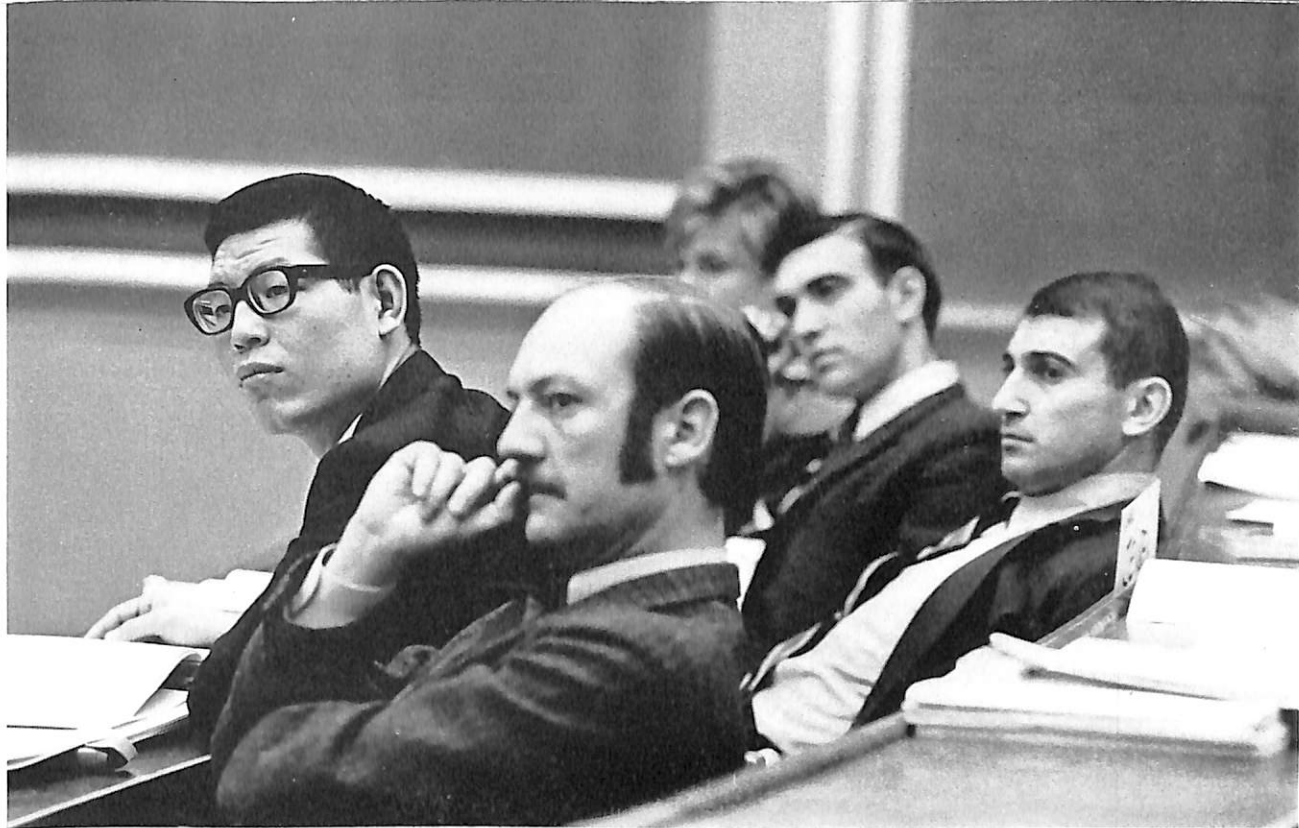
B.A. King lives in Southboro, Mass. "at the top of a meadow, near some woods, beside a river" with his wife, four children and a variety of pets. He is president of two companies in nearby Worcester.

In his dual role of accomplished photographer, King has exhibited at the Boston Museum of Fine Arts and the Worcester Art Museum among others, and his work has been collected by galleries and museums throughout the country. He has photographed a brochure for the Harvard Business School,

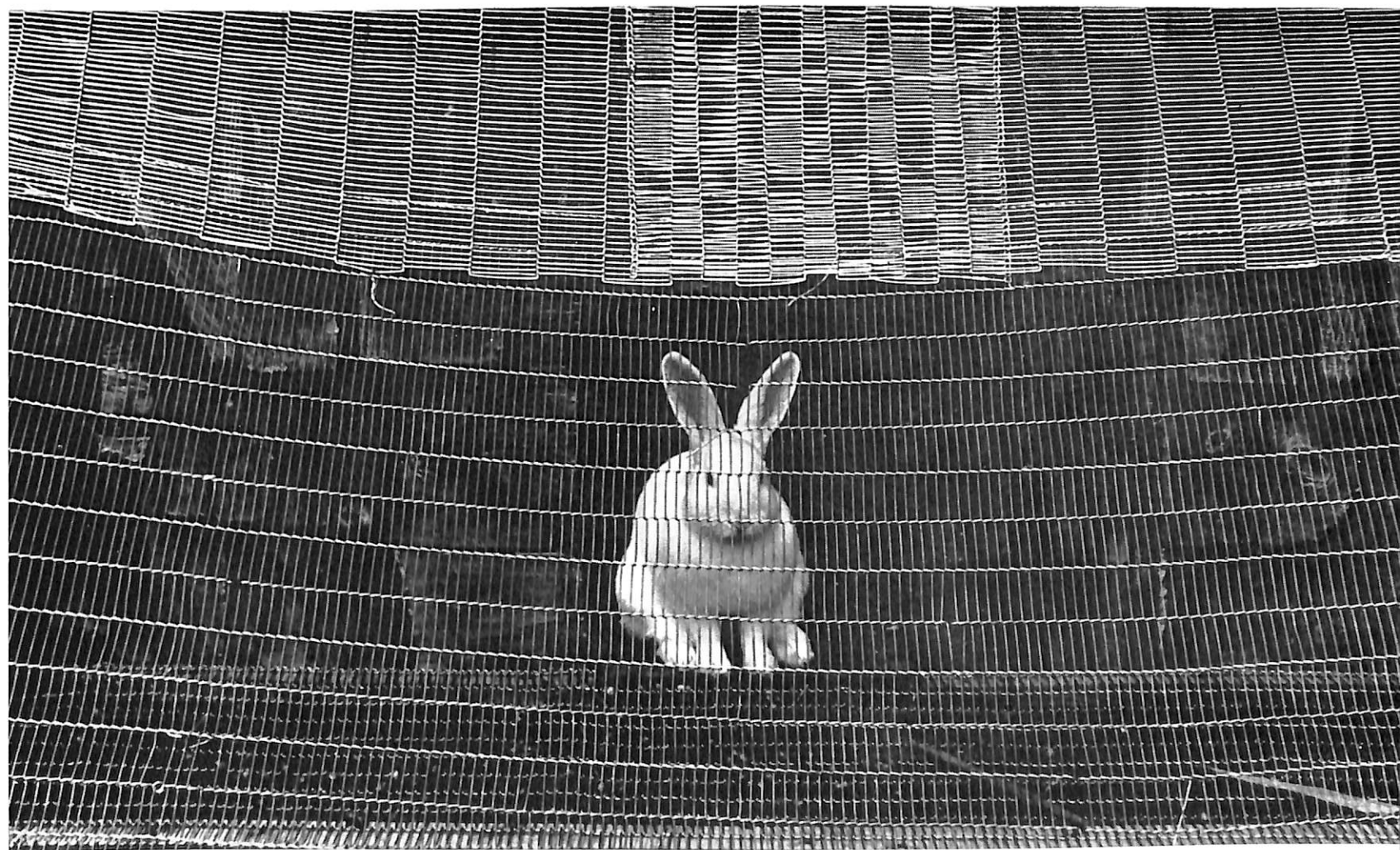












(several photographs appear on these pages) and has recently been commissioned by the Canadian National Film Board to photograph Indians in Northern Ontario.

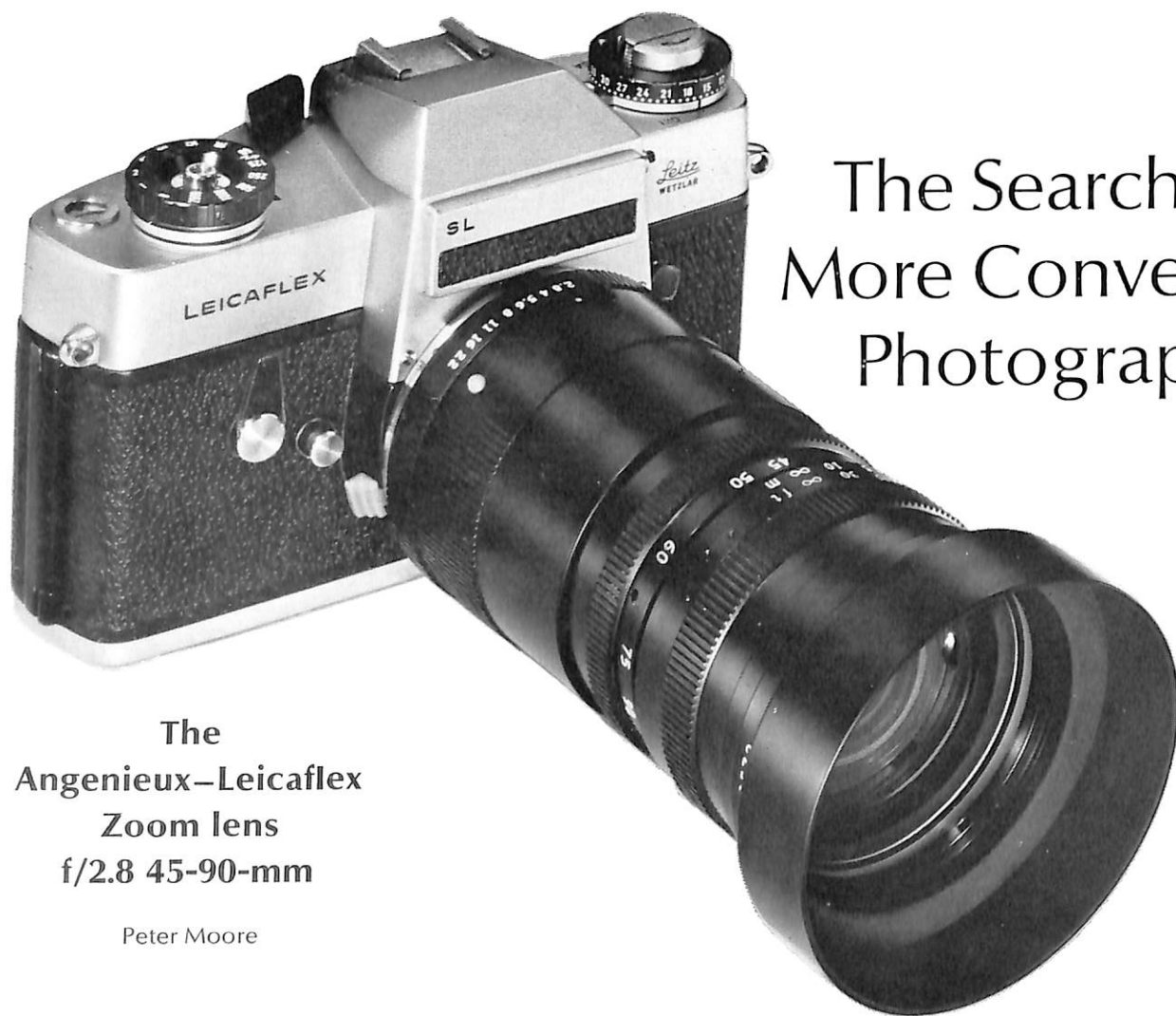
His business, he says, provides "some thrills" and the freedom to photograph what he wants to in his own way. It and photography offer "dynamic changes of pace from each other," and "neither one would be going as well as it is without the other."

King says, "Self-expression is my passion. Self-expression is for me a synonym for living. I think

I am aware of many of the possibilities in our times for good and bad, and I am glad that my time for living is now.

"I want to make a great quantity of images for people to enjoy which show the charm and excitement of the world the way it is and which will motivate people to work together, appreciatively and positively, at making the world a more sensible, kindly place."

King makes all his own prints. He uses both the Leica and Leicaflex cameras.



The Search For More Convenient Photography

The Angenieux-Leicaflex Zoom lens f/2.8 45-90-mm

Peter Moore

I've spent many years in photography using many cameras and many lenses, first as an amateur and now as a professional. Currently I'm working with up to three Leica bodies (two M2s and a Leicaflex) and lenses ranging from 21-to 180-mm. The results have been superb but the penalties have been heavy—literally. They include an aching shoulder and an occasional (and almost inevitable) loss of pictures while changing bodies, lenses, or films. In spite of careful planning and pacing of our shooting, there has always been that awful moment when some fleeting subject has outraced my frantic grab for another body or lens.

How many times I've envied a professional motion-picture cameraman his single, electrically-driven camera with its Angenieux 12-to 120-mm zoom

lens! In spite of its somewhat greater weight, the professional movie camera seemed a faster, handier and more flexible instrument than my batch of still-camera bodies and loose lenses. But I really like still photography; going into movies wouldn't be the answer!

The introduction of the Leicaflex SL began to solve some of my problems. This Leica-quality reflex, with its quiet shutter, brilliant viewing and focusing, and fool-proof lens-to-meter coupling, replaced my trusty Visoflex II except for technical work requiring mirror lock-up or direct access to the ground glass for measurements or using high-power magnifiers. Its uncannily accurate and selective behind-the-lens meter rapidly supplanted most of my handheld meters.

The SL was more selective than most of my spot meters and much faster because it was directly coupled to the camera's speed and aperture controls. Place the spot, line up the pointers, and shoot! So the SL became the meter for *all* of my cameras, as well as the mainstay of my work with longer lenses. In addition, it became possible to shoot films of widely differing emulsion speeds, like Eastman Plus-X and Kodachrome II daylight, simultaneously and confidently without risk of error due to reaching for the wrong body or forgetting under pressure for an instant which camera held the color. Using an MC meter for the black-and-white film in the M2s and the Leicaflex for the color, I had a goof-proof system. Two Leicaflexes would be even better. But give me time.



45-mm.



90-mm.

Needless to say, the announcement that an Angenieux zoom lens was being offered for the Leicaflex, whetted my appetite. When Leitz, the pioneer company in 35-mm still photography, teamed up with the most experienced manufacturer of professional-quality zoom lenses for movie use, the outcome would have to be something substantial. If it was a zoom lens good enough for Leitz, chances were it would be a zoom lens good enough for me!

Angenieux zoom lenses have virtually supplanted fixed focal-length, turret-borne optics in 16-mm and 35-mm motion picture production, particularly among new-wave and documentary filmmakers. Their optics run from an almost industry-standard 10x, 12-to 120-mm *f*/2.2 zoom lens for 16-mm

(costing about \$1000) to an almost unbelievable 20x zoom used in 16-mm and 35-mm productions (well over \$2000).

When the Leicaflex zoom lens arrived, I was struck by its maroon, red-velvet-lined presentation case. Considering that the lens cost over \$600, such a jewel case didn't seem inappropriate! It certainly provided excellent protection for the lens inside. Tearing myself away from such surface matters, I turned to the lens itself. The handsome, black-anodized mount was conspicuously well made, and zoomed and focused with velvety smoothness.

The rear portion of the lens was standard Leicaflex, rear diaphragm-control ring click-stopped at full and half-stop intervals from 2.8 to 22. And,

of course, that little red hemispherical dot that no one has succeeded in copying (that enables a Leica lens to be mounted on the run or in the dark) and the usual large and strong Leicaflex bayonet with its twin cams for auto-diaphragm and meter coupling. Moving forward, I found a knurled zoom ring calibrated in focal lengths from 45-to 90-mm; a second ring, broader and more heavily knurled, focused the lens from one meter to infinity. A removable lenshood taking standard series 8 filters, close-up lenses, etc. is included.

I was pleased to note that the distance scale for feet was now yellow—much more easily read in dim light than the red used on some earlier lenses. The whole thing was slightly longer and a bit heavier than the

135-mm f/2.8 Elmarit for the Leicaflex. Thus, suitably impressed with the finish, workmanship, and parentage of the new lens, I set out to make some practical tests.

I did a number of assignments working with an M2 equipped with wide-angle lenses and the Leicaflex with the zoom for middle and longer focal lengths. I found I could zoom and focus simultaneously by encircling the zoom ring with my thumb and forefinger and focusing with my second finger (made possible by the silky-smooth focusing mount). Thus, my left hand could take care of the lens while my right handled the camera controls, advanced film, and squeezed off exposures.

The lens mated perfectly with the SL's remarkable micoprism, snapping decisively in and out of focus even at the 45-mm setting. I found no detectable shift of focus either working from an exactly focused 90-mm setting (as recommended) and zooming back to my desired composition, or, even, focusing at 45-mm and then zooming to 90-mm (a test intended to show up and magnify any focusing error at the shorter focal length).

I began to feel that the sharpness gained in practice by being able to focus at the 90-mm setting even when shooting at shorter focal lengths, pretty much made up for the theoretical sharpness loss inherent in the many optical surfaces of a 16-element lens.

Soon, I was relying again on the exposure information given by the Leicaflex meter and the zoom lens which, together, gave the effect of a variable angle meter varying approximately from 4½ to 8½ degrees. I noticed, however, that I was shooting the zoom at wider apertures than past experience seemed to indicate. To check my intuition, I made a series of comparisons between readings through the zoom lens and a 35-mm f/2.8 Elmarit-R wide-angle, using a uniformly lit blank wall as a test target. The Leicaflex meter confirmed my intuition; the zoom was about half a stop slower than its calibrations indicated.

Checking with the Angenieux spec-sheet, I rediscovered that it claimed

only 70% light transmission and mentioned that the lens was f/2.8 in geometrical aperture. On first reading, I had assumed that the absorption had been taken into account when calibrating the aperture scale. I must admit that, in actual practice this loss is of little importance however. The camera's meter reads the *actual* light transmission of the lens when in use and automatically takes into account any variations from the theoretical geometrical aperture.

If you are working very critically with color, using a specialized meter (incident or one-degree spot) allow an extra half-stop. If you are using Leicaflex/zoom exposure readings with other cameras or lenses, you can safely stop down half a stop. For black-and-white, the discrepancy can be ignored for most purposes. This light loss is the normal and inevitable result of the lens's 16 elements, and is certainly common among other zooms. Before lens coating such a lens construction would have been mainly useful as a combination neutral density filter and diffuser anyway. A more important result of my blank wall experimentation, was to discover that the lens's working aperture held absolutely constant from one end of the zoom range to the other.

In practice, I found myself using the zoom more and more—and getting a gratifying number of “hits” that would have been clean “misses” without it. This is what photography is about—avoiding missed opportunities. The ability to change focal length instantly without losing focus or exposure settings is an immense aid to rapid, spontaneous shooting.

In photographing a child's birthday party at a Head Start nursery school, I was able to flick from an overall view of the table to small groups of two or three children. Taking a step or two closer gave me a portrait at the 90-mm setting. The Leicaflex meter with the lens at the tele setting gave me accurate spot readings in the contrasty cross-lit situation. Sharpness was excellent. This is a great lens for candid work with both big and little people.

The ability to “cross a street” with

a twist of the wrist, or to zoom from a full stage theatrical shot to a shot of a dramatic group of actors, is of inestimable value. Critical composition from a fixed camera position, on or off a tripod, is rendered easy by the zoom. This lens would be of great value to the color worker interested in obtaining tight color croppings in the camera while travelling light.

If a zoom lens could be made to run from 35-to 90-mm, it would be good for close to 95% of our picture taking. At this stage of the optical ball game, the problem of zooming the retro-focus wide-angles needed for a full-frame SLR body seems to be far from solution. Going from 45-to 90-mm seems to take care of perhaps 75% of our needs, leaving most of the balance for a compact, light weight medium wide-angle.

A word about sharpness. First—this is the best and most distortion-free zoom lens I've ever used. It is fully sharp enough for 11x14 or larger prints for critical work at its critical apertures, f/8 to 22. Wide-open, it just isn't going to touch a Summicron (not much can!) but it's still plenty good enough for 11x14's of “people pictures,” flattering portraits, or anything candid. You're not going to shoot test charts or do microfilming wide-open anyway, with any lens, if you know what you're doing. When working wide-open, use the basics common to any lens—fill the frame (easy with a zoom lens) and hold it steady. Remember that to get an equally sharp handheld exposure at 90-mm requires doubling the speed needed at 45-mm. It is tempting to try to forget this, but disillusioning in the end.

In summary, this is probably the “state-of-the-art” zoom lens for still work at this time. Others may zoom longer, but none are better. Superb workmanship, strict quality control, and careful setting to the best SLR body on the market have moved us a step closer to the ultimate ideal of a truly convenient, flexible picture making instrument. With a Leicaflex SL/MOT we're almost there.

This lens will straighten a lot of backs, and shrink a lot of gadget bags.



Alan Arkin by Bob Willoughby

Alan Arkin

Photographer

There was a period during my adolescence when I felt isolated not only from other people but inanimate objects as well. Not noticing that most of my contemporaries were suffering from the same condition, I worried strenuously about my sanity. In an attempt to re-establish some rapport with the outside world, I bought a 35-mm camera at a pawnshop and began taking pictures.

At first I confined myself to heroic portraits of my family, taken from beneath, with very dramatic

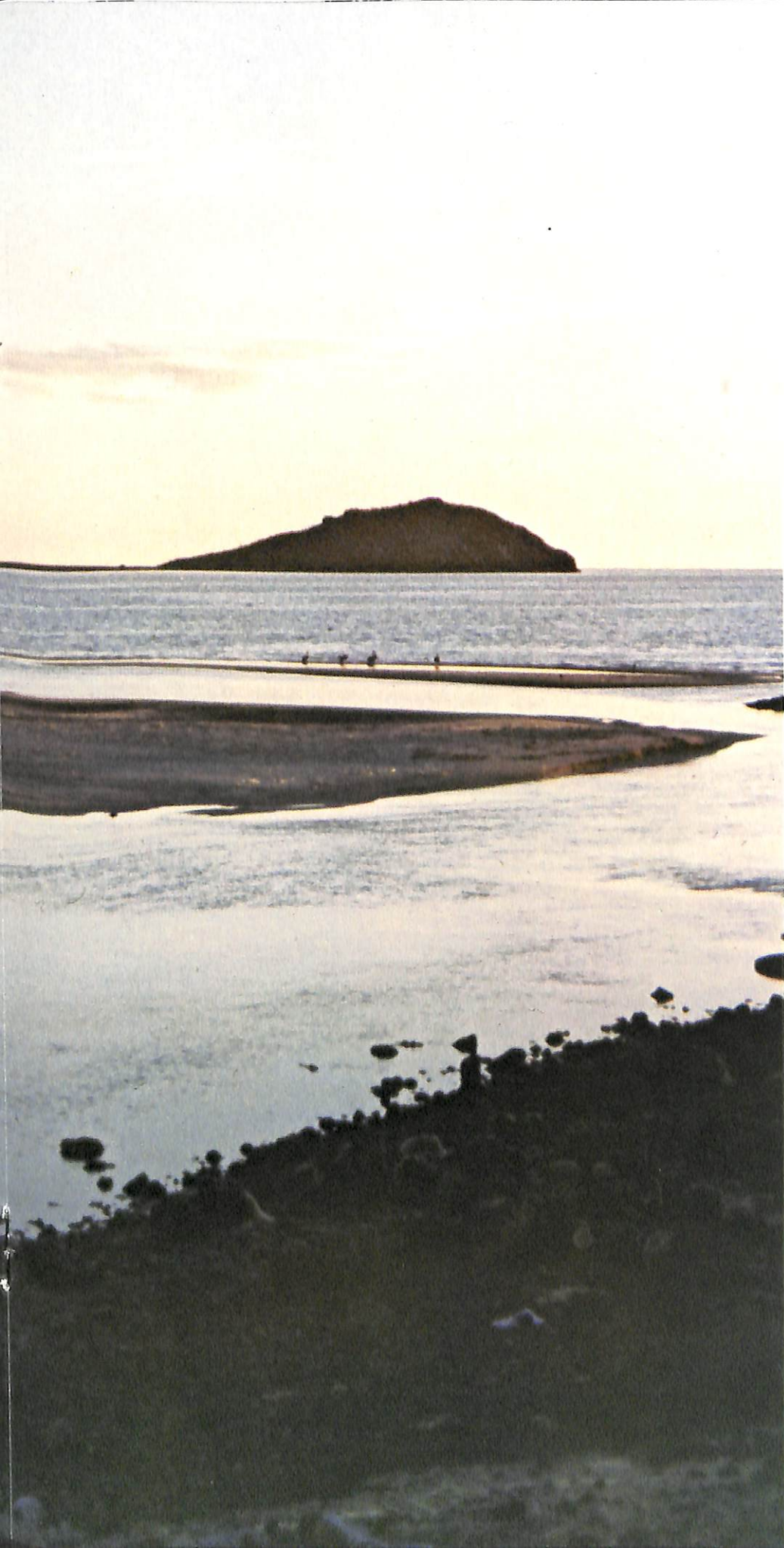
lighting. As I look back over them now, they remind me of Russian war posters. When I had exhausted the patience of my family I moved on to candid shots of animals, derelicts and nuns, and remained there for many years.

The interesting thing was that, although I loved taking pictures (and still do), it never established that connection with the outside world that I had hoped for. What it did instead was to give a form and substance to my isolation. Traipsing through Coney

Mike Nichols, Guaymas, Mexico, 1969







La Playa de Cortez,
Guaymas, Mexico,
1969

Island with my camera behind my back, I became a secret sniper, picking off people left and right with a silent weapon that left no mark; and I believed also, like an Arab, that I had stolen their souls.

When a subject caught me at my espionage, I developed a way of lowering the camera and looking past them intently as if the object of my concern was immediately in back of them. This would confuse the subject long enough for me to beat a hasty retreat with my heart pounding and fearing for my life.

I miss those days. Lately I have become an object for other people's secret scrutiny, so the tables have turned.

Accepting my fate, I have confined my interest in still photography once again to my family, and an occasional story while on location with a film. But then, recently I had the opportunity to direct a movie, which brought back some of my old perverse joy. I wasn't actually behind the camera, but I watched stealthily while the actors went through their paces of living out their imaginary lives, and they did me the courtesy of pretending I wasn't there. It is the happiest I have ever been, and I hope to continue directing films until I am caught and carried away.

ALAN ARKIN

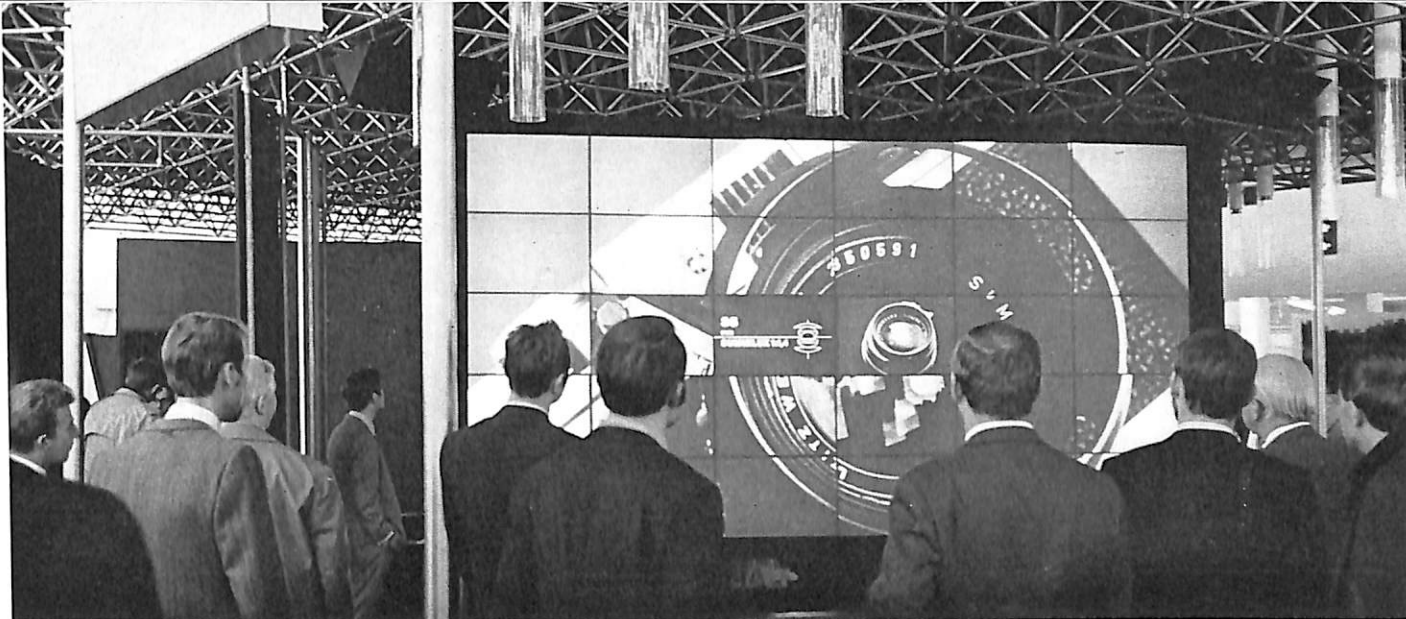
Alan Arkin is currently starring in the motion picture "Catch-22." The noted actor has also directed several productions for the New York stage and has just finished directing his first feature length movie, "Little Murders." He uses Leica and Leicaflex cameras. Ed.



Courtyard, San Jose de Guaymas, Mexico, 1967

Matthew Arkin, Fire Island, N.Y., 1967

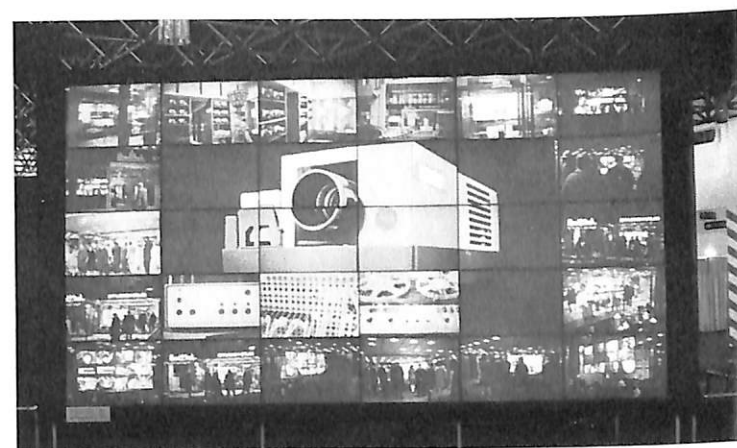




Leitz at Photokina-70

Arthur Barney

AV-Center a Heavily Attended Attraction



Photokina is much more than simply a showcase for new equipment. For nine hectic days in Cologne, from the 3rd to 11th of October, photographers of every stripe, and from every corner of the globe, talked trends and techniques, pictures and processes.

The many elaborate pictorial displays organized by L. Fritz Gruber, *photokina's* famous "cultural commissar," were every bit as well attended as the some 688 commercial stands of the international photo industry.

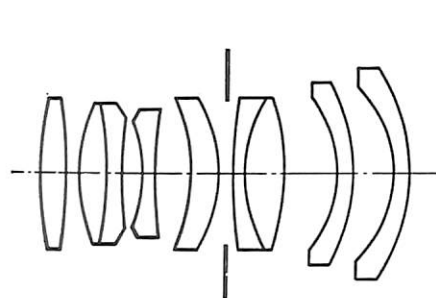
This unique *photokina* spirit was well exemplified by the large Leitz exhibition area which included a section staffed by experts from the Leica-Technik and other Wetzlar

factory departments who demonstrated and discussed tools and techniques with visiting firemen from morning to night. A new Leitz audio-visual "AV-Center" for Leica/Leicaflex still photography as well as Leicina Super movies was another heavily attended attraction. The quality of these films was such that many skeptics had to be led behind the rear-projection screen before they would believe that these had really been made on ordinary Super-8 ciné film.

Two large-screen multi-media Leitz presentations that drew considerable critical acclaim used thirty electronically controlled Pradovit-Color slide projectors in

one case, twelve synchronized pairs giving smooth fade effects in the other. Produced by talented Düsseldorf photographer Otto Bernstein, they vividly illustrated the many-faceted world of modern miniature photography with interchangeable lenses. And one of the real sensations of the fair was Leitz' introduction of no less than eight new interchangeable lenses, six in meter-coupled auto-aperture mounts for Leicaflex cameras, one for double-duty with Leica Visoflex II/III reflex housings as well as on the Leicaflex, plus an impressive 800mm prototype embodying entirely new principles for advanced long-lens color correction.

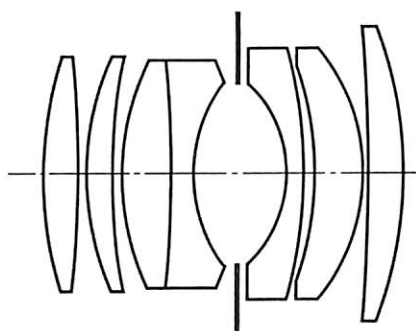
Introduced at Photokina



35mm Summicron-R f/2

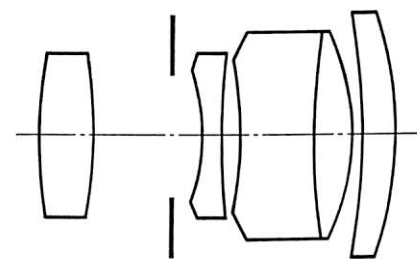
The three most widely used Leicaflex focal lengths have each been upped an aperture stop, and Leitz now offers a 35mm Summicron-R f/2, a 50mm Summilux-R f/1.4, and a 90mm Summicron-R f/2. Current 35mm f/2.8, 50mm f/2, and 90mm f/2.8 "-R" standbys will, of course, continue in the Leicaflex lens lineup.

The new 35mm Summicron-R f/2 is a complex 9-element, 7-group retro-focus design that may well prove to be the best 63-degree wideangle optic ever built by Leitz. It provides unusually even illumination of the full film format, with complete freedom from mechanical vignetting. Like the other members of this available-light trio, it is a particularly flare-free optic delivering crisply contrasty images, even at full aperture.



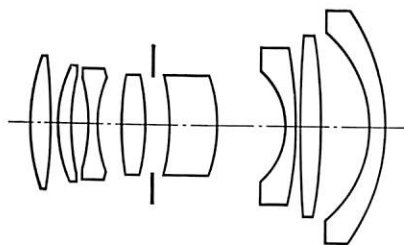
50mm Summilux-R f/1.4

Contrast and coma correction of the new 50mm Summilux-R f/1.4 match that of its redoubtable Leica-M equivalent, with an even flatter field. *Coma is the off-axis optical aberration that causes light points to appear as tear-drop shapes.* Its contrasty imagery holds up even against strong back-lighting, and the inclusion of bright light-sources within the picture field will cause no problems with this f/1.4 lens. The design is a 7-glass, 6-group modified Gauss type, with additional correction obtained from a thin "air-lens" located between its second and third elements.



90mm Summicron-R f/2

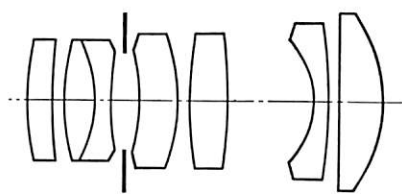
Less than half an inch longer than the 50mm f/1.4, the new 90mm Summicron-R f/2 is a 5-glass, 4-group true telephoto design with an overall length of only 62mm, or only about two thirds of its focal length, including a handy built-on telescoping lenshood. It's an extremely crisp lens with high optical contrast, and one feels this visually from the positive way in which the image snaps into focus on the Leicaflex screen. Ninety millimeters has always been a happy focal length for Leitz designers, and this new f/2 matches the very high performance levels of its Leica and Leicaflex relatives.



28mm Elmarit-R f/2.8

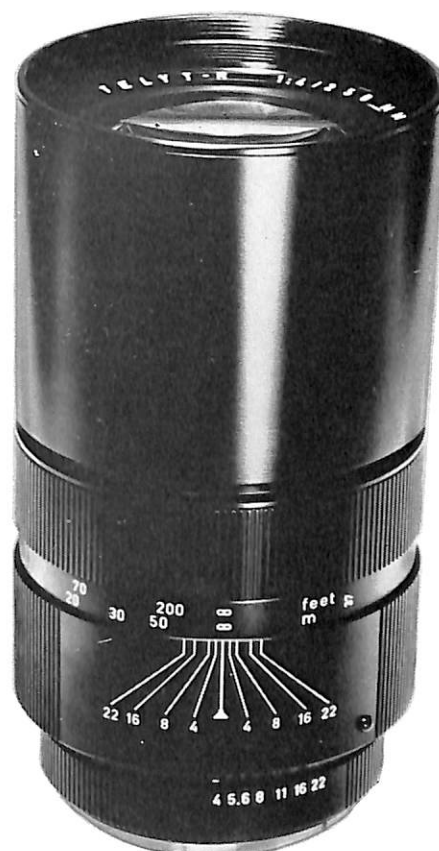
Two more Leicaflex wideangles introduced at *photokina* in addition to the 35mm Summicron-R f/2 were a remarkably small 28mm Elmarit-R f/2.8, and the well-known 35mm PA-Curtagon from Schneider/Kreuznach in a new "-R" mounting.

Despite its eight air-spaced elements and retrofocus design, the very compact 28mm Elmarit-R f/2.8 protrudes only 40mm forward from the camera body, and weighs in at a mere 9¼ ounces. Although many air-glass interfaces were required for the correction, their surface curvatures are so gradual that reflections are imaged far forward of the film-plane, thus enhancing optical contrast and eliminating problems with strongly back-lighted subjects common to this 76-degree extreme-wideangle focal length. The optimum aperture, after which stopping down increases the depth-of-field without improving the resolution, falls between f/4 and f/5.6, with a remarkably flat field for this focal length.



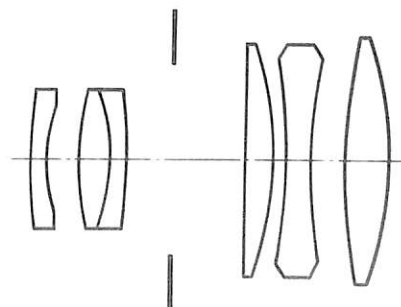
35mm PA-Curtagon-R f/4

Unlike the majority of 35mm camera lenses which are corrected for a 43-44mm image circle, in order to cover the diagonal of our 24x36mm film format, the 35mm PA-Curtagon-R f/4 is capable of covering a 57mm image circle. At the base of its mount is an eccentric ring calibrated from "0" to "7," permitting the whole lens to be shifted laterally by as much as 7mm in any desired direction. This is the simplest and easiest way for avoiding converging vertical lines when, for example, the camera would otherwise have to be tilted upward in order to include the top of a tall building in the picture. In addition, this shift is also extremely valuable for eliminating empty, unwanted foreground areas in normal "street shooting." With its maximum shift of 7mm, this most useful new addition to the Leicaflex system provides a background height gain—or foreground loss—equal to one fifth of the focusing distance. Because of its shifting mount, the 35mm PA-Curtagon-R f/4 has a manually preset aperture control.



250mm Telyt-R f/4

Another important addition to the Leicaflex team is a sports- and action-minded 250mm Telyt-R f/4 which is now the longest focal length to offer the convenience of meter-coupled auto-aperture operation. Fast for its focal length, this new 10-degree lens is a very highly corrected 6-glass, 5-group true telephoto design whose overall barrel length is only 154mm. It's a pleasure to focus at f/4, and reaches its optimum aperture only one stop down, at f/5.6. Because of its high aperture and many glass elements, the 250mm Telyt-R f/4 weighs in at a fraction of an ounce over three pounds, making for rock-steady freehand shooting.



280mm Telyt f/4.8

Knowledgeable Leicamen were surprised by the introduction of an improved version of the 280mm Telyt f/4.8, particularly because the existing version is famous for its optical excellence, even when used with 6x6 cm and even larger formats. This revised edition uses an all air-spaced 4-element design resembling its predecessor, but affords even higher contrast and covering power. Professionals who use the 280mm Telyt additionally for various middle-format rollfilm reflex cameras—the adaptation is quite simple because of its removable optical unit, which can even be purchased separately—will appreciate the new lens' greater covering power, and in a post-*photokina* visit we saw this demonstrated impressively on the ground-glass of a 4x5-inch camera.

The new 280mm Telyt f/4.8 also features a modernized mount which focuses down 10¾ feet—giving a 1:10 image-to-object size ratio for big, format-filling headshots—and attaches directly to the Visoflex II/III housings, without the previously required intermediate adapter "OUBIO," or No. 16466. For Leicaflex use the adapter No. 14127 is needed, and on the "SL," inboard exposure readings are made with the stop-down method.

800mm f/6.3

Also shown at Photokina was a prototype 800mm f/6.3 achromat approaching apochromat qualities and characteristics. Special glass developed in the Leitz laboratories is used in the design of this 3-element lens giving it completely new image performance standards. Unlike many long focus lenses in this category, the new 800mm is not a mirror but a glass lens. It can be stopped down in the normal way by means of an iris diaphragm, without loss of aperture angle or abnormal reproduction of unsharp image areas. The 800mm will take its place as Leitz' longest focal length in time for the 1972 Olympics. Because of the importance of this optical breakthrough a

more comprehensive and detailed account will appear in the next issue of LEICA PHOTOGRAPHY.

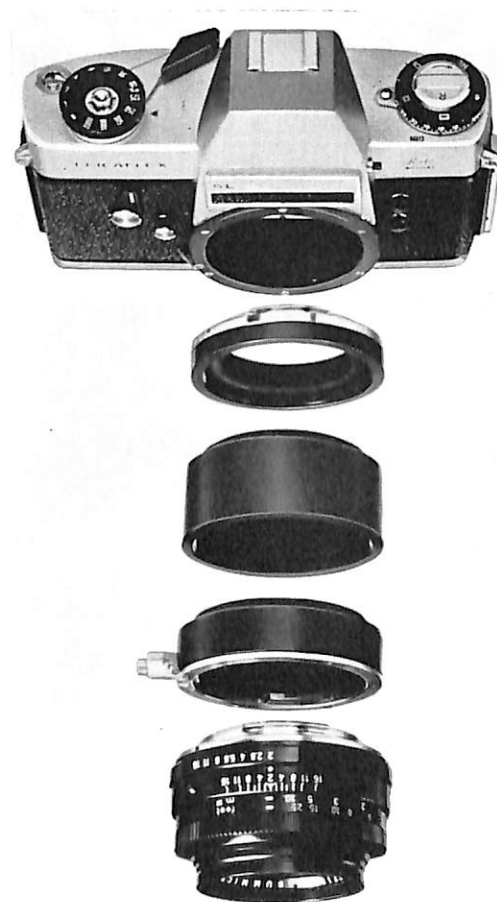
The Leitz Philosophy of Optical Design

In explaining their optical design philosophy for Leica and Leicaflex lenses, Leitz spokesmen emphasized their concentration on three basic goals: optical specifications appropriate to the lens' general field of application, the increasing of optical contrast through improved correction of residual aberrations and the reduction of reflections within the system, and the maintenance of the high standards of detail resolution for which Leitz optics have always been famous.

Stating that "optical progress is a matter of continuous evolution rather than of revolutionary changes," one release gave information about the recently recomputed 35- and 50mm Summicron f/2 lenses for Leica M-cameras. Although the new 6-glass 50mm Summicron has one element less than its predecessor, it is stated to yield higher image contrast with an even flatter field, right down to the 28-inch near rangefinder-focusing distance of the Leica M4. Any loss of corner definition is practically unnoticeable, and the optimum aperture is reached at f/5.6.

The new 35mm Summicron f/2 is a 6-element, symmetrical Gauss derivative with a barrel length some 7.3mm shorter than the original 8-glass version. In addition to a gain in image contrast, this recomputed optic is stated to provide greater freedom from vignetting at high apertures between f/2 and f/4. Better field flatness also permits its rangefinder focusing mount to close in to 28 inches.

Frequent recomputation of old favorites keeps Leica and Leicaflex lenses abreast of optical progress, and it is for this reason that Leitz continues to emphasize research into the development of new types of optical glass, and actually manufacture certain special types in small quantities.



Leicaflex Extension Tube Set

The three-piece Leicaflex extension-tube set, permitting one-to-one, life-sized imagery with the 50mm Summicron—R f/2, and extended closeupmanship with all "R" optics up to the 250mm, was shown at *photokina* with a new spring-loaded aperture control mechanism. Cock a side lever, and the lens is wide open for focusing. Press a button—or use a double cable release—and you get automatic stop-down to working aperture just before the shutter starts whizzing. It's called "semi-automatic" because you've got to reset it between shots.

Versatile Tandem Mounted SL-MOTs

What's faster than a Leicaflex SL-MOT at 3-4 pix-per-sec? Two SL-MOTs chopping away on a tandem mounting bracket at 6-7 pps, that's what. The two motors are cable-connected so that when each starts its transport cycle between frames, it fires off the other, thereby doubling the firing rate. Field-tested by news-pros at the recent ice-hockey championships in Stockholm, and the Mexican World Cup soccer matches, the tandem mounting proved most effective when one camera had a short, the other a long-focus lens to produce close-up and overall-view sequences simultaneously. Others loaded up with black-&-white and color.

Other photokina-fresh SL-MOT gear included a sturdy tripod mounting bracket, a new handgrip, and a wired remote-control firing box with its own frame counter.



New Leicaflex Lenshoods

For the new Leicaflex 28, 35, and 50mm optics, lenshoods with some new twists: align pin on lens with slot in hood flange, press in and turn to the right to lock; to unlock, pull away from lens, and turn to the left. Yes, it's the same system recently introduced

on the 21mm Super-Angulon-R f/4.

But what's that funny little milled wheel at the side? The new Leitz way of turning a polarizing filter without taking the hood off. Try it!

For the 28mm Elmarit-R f/2.8 and 35mm Summicron-R f/2, the same rectangular hood. The 50mm Summilux-R f/1.4 and 35mm PA-Curtagon-R f/4 are de-dazzled by their individual roundies.

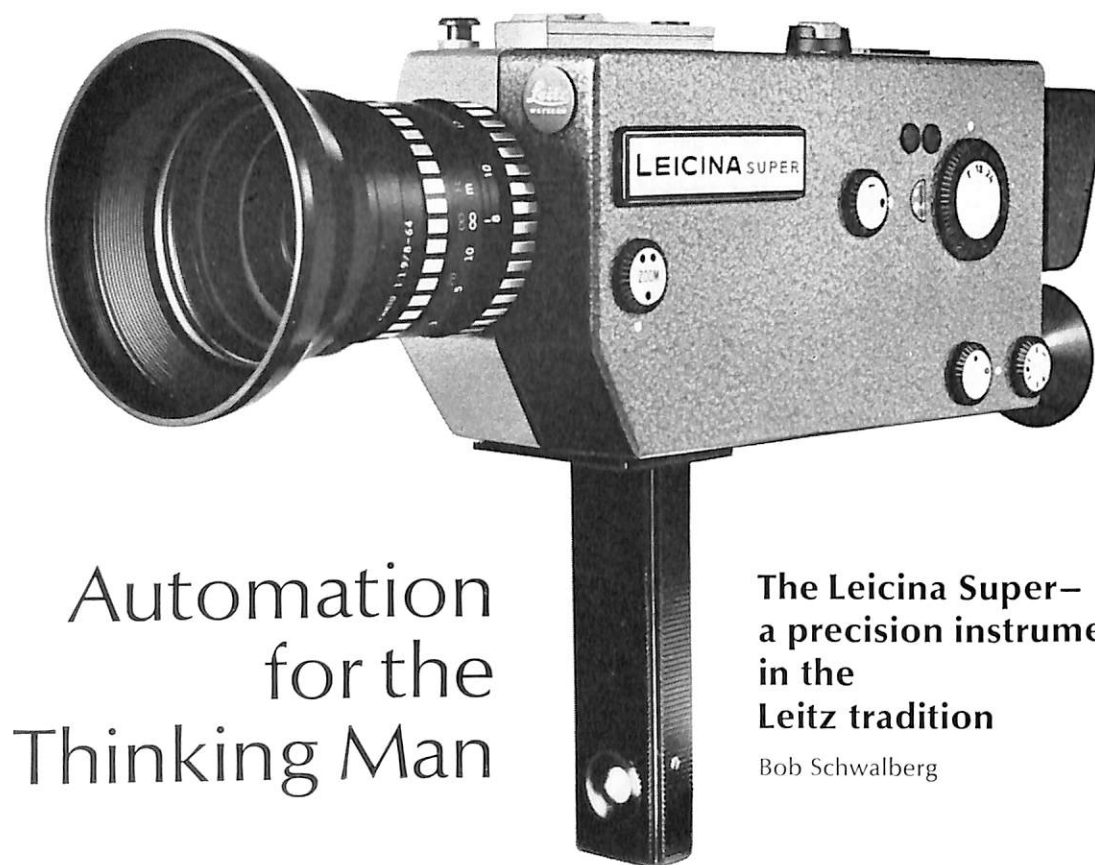
—35mm Summicron-R f/2

50mm Summilux-R f/1.4



28mm Elmarit-R f/2.8





Automation for the Thinking Man

The Leicina Super— a precision instrument in the Leitz tradition

Bob Schwalberg

Camera mechanisms may be divided into two functional groups: those directly involved with the formation of photographic images, and those regulatory functions that control their accuracy and constancy. In an automated motion-picture camera these regulatory functions are perhaps more critical than in a still camera of similar quality, because cine film must be transported at a very uniform rate with extremely precise spacing between successive frames. More than this, filmed scenes are often sufficiently long, and embrace such wide fields of view through camera panning, as to contain a variety of different subject lighting conditions for which exposure compensation is essential.

The *raison d'être* for electronics in contemporary camera design is to replace costly mechanical parts that require very careful manufacture and adjustment, and which promise only questionable reliability and longevity.

The new Leicina Super, a cartridge-loading descendant of the original spool-fed 8-mm Leicina models manufactured by Ernst, Leitz, Wetzlar, between 1960 and 1965, probably represents the coming generation of electronically controlled cine cameras.

The Leicina Super contains more electronics than many portable radios and tape recorders: 10 transistors, 11 diodes, and four so-called hybrid integrated circuits (IC's) of the thick-layer type. These IC's regulate the ASA/DIN film speed index (*automatically set by insertion of the Super-8 film cartridge*), the filming frequencies of either 18, 24 or 54 fps, the tiny servo-motor that controls the lens aperture, and finally, the electronic camera release mechanism that simultaneously actuates the through-the-lens CdS exposure control system when the motor begins to drive film.

Space-age technology aside, the mechanical heart of any motion-pic-

ture camera is the motor that drives the film. The Leicina Super drive motor has an iron-free armature to ensure smooth running without the interruptions that engineers call "cogging." At its rear, directly connected to the same rotary shaft is a small tachogenerator. When the motor runs, this parasite produces a small AC current whose frequency is directly proportional to the motor's rpm.

This current enters an electronic circuit through a capacitor whose internal resistance to the flow of electricity is inversely proportional to the input tachogenerator frequency, and is electronically compared with a reference current from another independent regulatory circuit.

When the frequency of this tachogenerator current is too high, indicating that the motor is running too fast, the previously mentioned hybrid IC causes the camera to slow down, and vice versa, with negligible delay. This

new system of electronic feed-back enables Leitz to state rather tight tolerances for the Leicina Super's three filming speeds. These are: plus-or-minus three percent at 18 and 24 fps, and five percent at 54 fps.

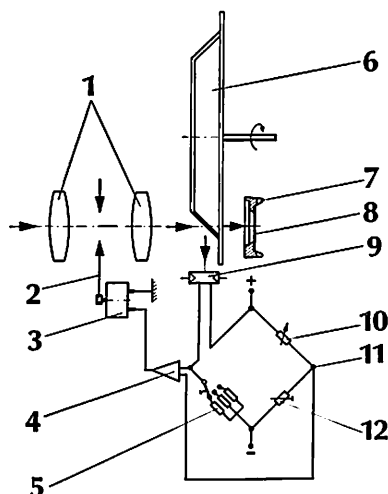
The 54 fps slow-motion filming frequency is obtained whenever the camera is already running, by pressing a small button marked "54" on the right-hand forward corner of the top deck. This is an over-ride, permitting instantaneous changeover to 54 fps, with appropriate aperture compensation, regardless of whether the camera is set for normal filming at either 18 or 24 fps. Alternatively, when the user wants to film only in slow motion, this "54" button can be locked down so as to permit use of the normal thumb-release.

The Leicina Super can also be set for single-frame filming, and herein lie several stories. If single-frames for titling or trick effects are to be combined with normal filming, it is advisable to work at 18 fps. Under this condition, the single-frame exposures will be only negligibly longer than those at 18 fps, and the through-the-lens light meter can be relied upon to produce even exposures. A single-frame counter, calibrated from 0 to 40, is located on the left-hand side of the housing.

For the record, the Leicina Super's effective exposure times are 1/38 sec at 18 fps, 1/53 sec at 24 fps, and 1/114 sec at 54 fps. These data are for a running motor, rather than for the start-and-stop condition of single-frame shooting. The camera's rotary sector-blade shutter is moved with sufficient speed for a very accurate exposure match at 18 fps, but not with the two higher filming rates.

The Leicina Super has two release buttons, one combined with its folding handgrip and intended for thumb operation with either hand—and a second on the top deck that is additionally threaded for a standard cable-release. When single-frame exposures are made with either of these release mechanisms alone, a framing rate of approximately 3 to 5 fps can usually be achieved.

Leicina Super electronic through-the-lens exposure control system.



- 1—Zoom Lens
- 2—Square "Cat's-eye Aperture Blades
- 3—Aperture-setting servo-motor
- 4—solid-state amplifier
- 5—IC controlling three running speeds
- 6—conical mirror attached to front of shutter blade
- 7—film gate
- 8—film
- 9—CdS photoconductive cell
- 10—external "+" and "-" exposure control
- 11—Wheatstone-type measuring bridge
- 12—IC for cartridge-set film-speed index

Light entering through the lens is reflected by the 45-degree conical mirror (6) attached to the shutter blade, and received by the CdS photoconductive cell (9), which is one of the four legs of a measuring bridge-circuit (11). The other three legs are an IC controlling the cartridge-set film-speed index (12), another IC with steps for the camera's 18, 24, and 54 fps running speeds (5), and an externally set variable resistance (10) providing optional exposure correction over a plus-or-minus one f/stop range.

The electrical output of this bridge-circuit, which is directly proportional to the amount of light received by the CdS photoconductive cell (9), is amplified by the IC (4), and fed to the servo-motor (3) which regulates the camera's two aperture blades.

But, if the handgrip thumb-release is held down, the upper release acts like an electrical flip-flop, giving one exposure when pressed, and another when released. This quite easily permits a "double single-framing" rate of about 8 or 9 fps, and is ideally suited for creating humorous effects reminiscent of old-time movies.

The electronic through-the-lens exposure control system (see diagram at left) has been designed to receive the same amount of illumination as the film does when the shutter is open to expose each frame, and offers a number of useful options in addition to straight point-and-shoot automation. It is a very slightly center-weighted averaging meter, measuring the central 80 percent of the viewfinder field at all focal settings between 8- and 64-mm.

The metering ray-path begins with a 45-degree conically shaped mirror attached to the camera's rotary sector blade, and the CdS cell is switched on only when the motor is running, or when the white button on the top forward section of the camera is pressed. This button permits setting correct exposure before starting a scene, and also shows whether the light is sufficient for filming, as well as the aperture that will be used.

A black button directly behind the white one affords very convenient fade control by closing the lens aperture completely. A fade-out is achieved quite simply by pressing this black button toward the end of the run, stopping the scene when the viewfinder signals a black dot after passing f/22. If a scene is started after pressing the black button to close the aperture, professionally smooth fade-ins are obtained automatically as the camera finds the correct exposure aperture.

Between these white and black buttons, which the user learns to find by feel once he's experimented a bit, there is a "STOP" sign indicating that pressing both buttons simultaneously locks the exposure aperture. If it is desired to film a sequence at the same aperture from start to finish, it is only necessary first to establish the correct aperture by pressing the white button.



Wilhelm Schaefer, chief of Leicina design team, explaining open Leicina Super to author, in Wetzlar assembly room.

and then to lock this by pressing both together.

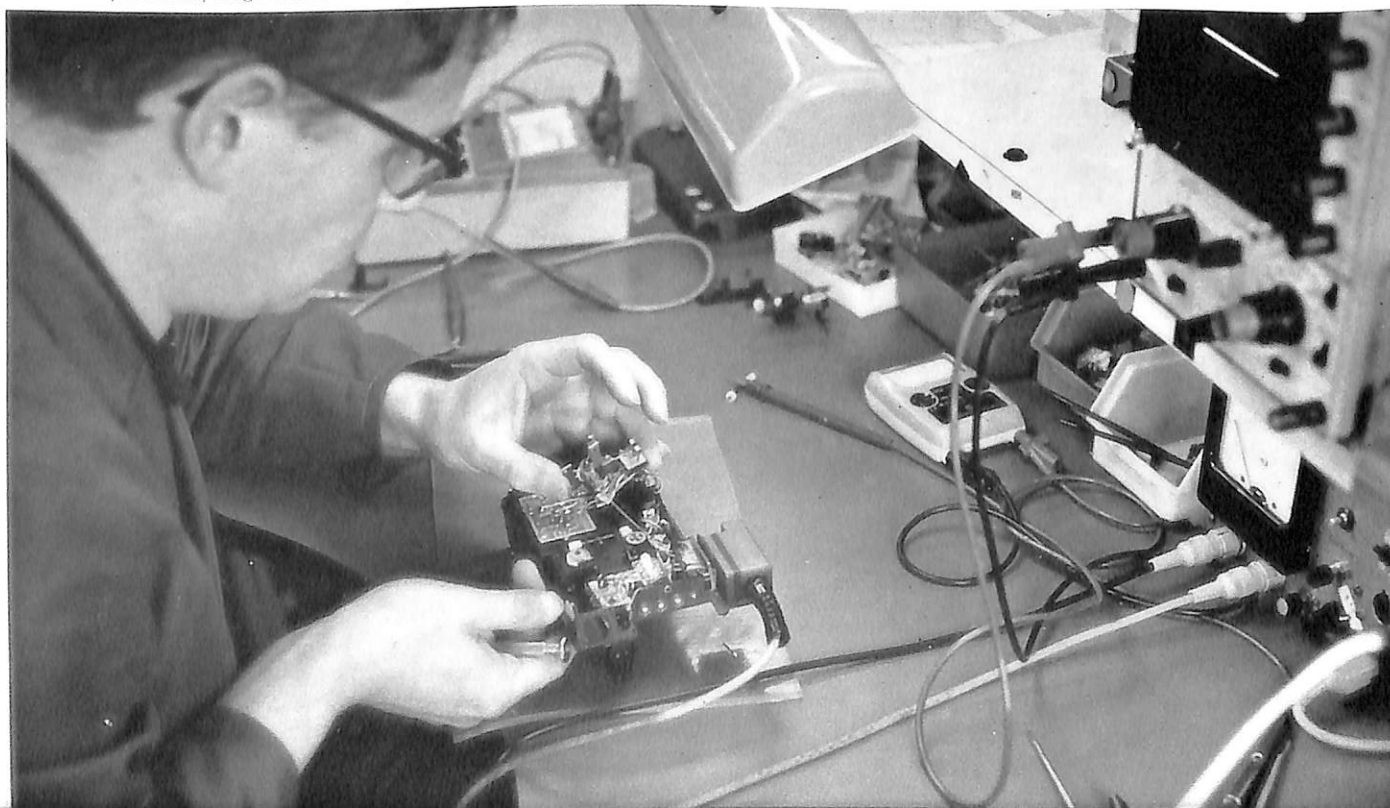
In a strongly back-lighted situation, for example, a white-button exposure reading can be made from a weakly illuminated foreground subject, and this aperture held by pressing both

buttons as the scene is filmed. The opposite effect, a silhouette, can just as easily be achieved by reversing this procedure, using the white-button to predetermine exposure for the brighter background.

Narrow-angle selective measuring

similar to that provided by the Leica-flex SL can easily be achieved by taking a white-button reading with the lens zoomed out to its longest focal length, 64-mm, and then locking the aperture obtained. This method provides probably the best back-light con-

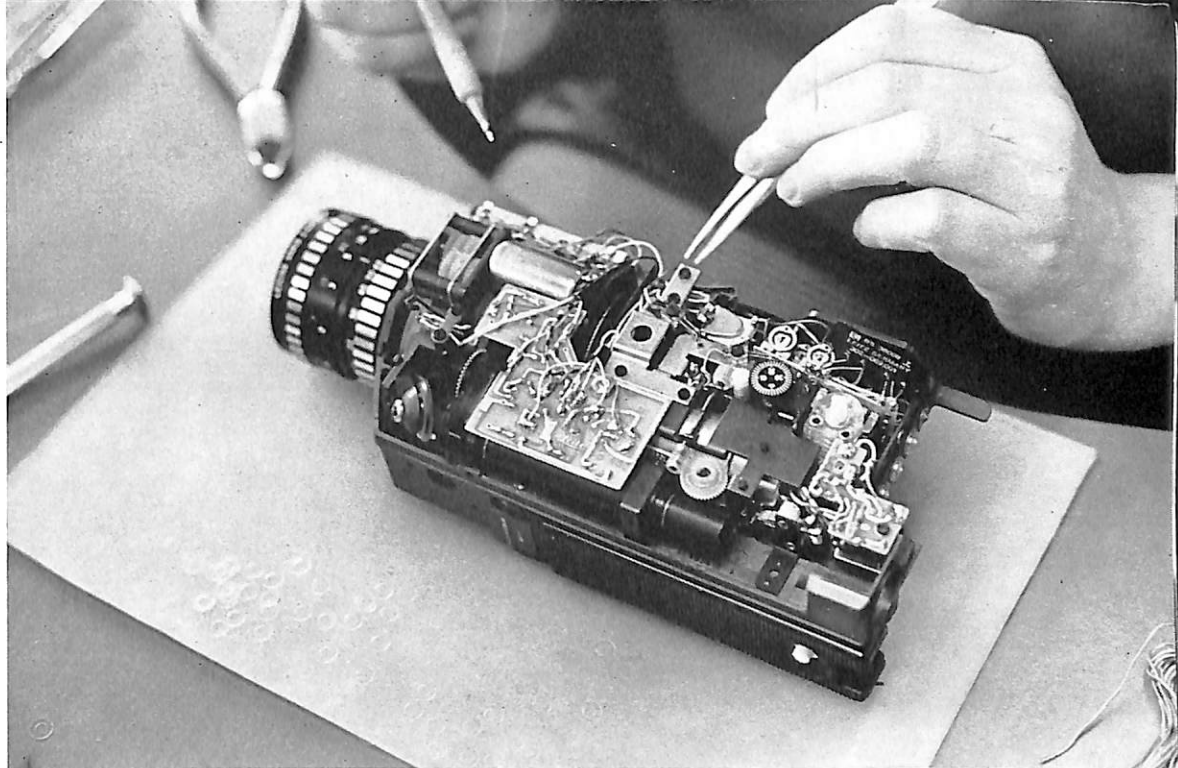
In this early assembly stage the Leicina Super looks a lot more like a complicated transistor radio than a movie camera!



trol possible with a cine camera, and is useful in many other normally encountered situations as well. If, for example, your leading lady is going to pass through a "salt-and-pepper" area of varying brightnesses, her face or dress can be pre-measured by combining the facilities of the white-and-black buttons and the 64-mm long-focus lens setting. Then, by filming at this aperture the camera ignores all other incidental brightness values to produce uniform exposure from beginning to end.

But even without this trickery, the Leicina Super provides built-in insurance against too-rapid exposure changes caused by the sudden appearance of dark or bright objects within the lens field. This is a problem with most cameras—including the three previous Leicina models!—which use lightly pivoted aperture blades connected directly to a meter galvanometer. The Leicina Super belongs to the minority of contemporary cine cameras whose apertures are servomotor controlled. This means that inter-scene exposure corrections are made slowly and steadily, with the smoothness of a Hollywood cameraman. *(The Leicina Super has a symmetrical aperture, but not a conventional iris diaphragm as has been incorrectly reported elsewhere. Actually, it's a square cat's-eye design consisting of two sliding metal plates with 90-degree end cut-outs. Aside from being inherently more rugged than floating asymmetrical galvanometer blades, this design maximizes depth-of-field at any aperture—almost as effectively as a round aperture—and eliminates the strangely uneven depth-of-field effects sometimes experienced with non-centered auto-aperture blade mechanisms.)*

Still another feature of the Leicina Super's system of creative exposure automation is provided by a small dial at the right-hand front of the camera. This is actually one leg of the metering bridge circuit—No. 10 in the diagram—and permits the introduction of optional exposure corrections over a range of plus-or-minus one full f/stop. For normal filming, this dial should be

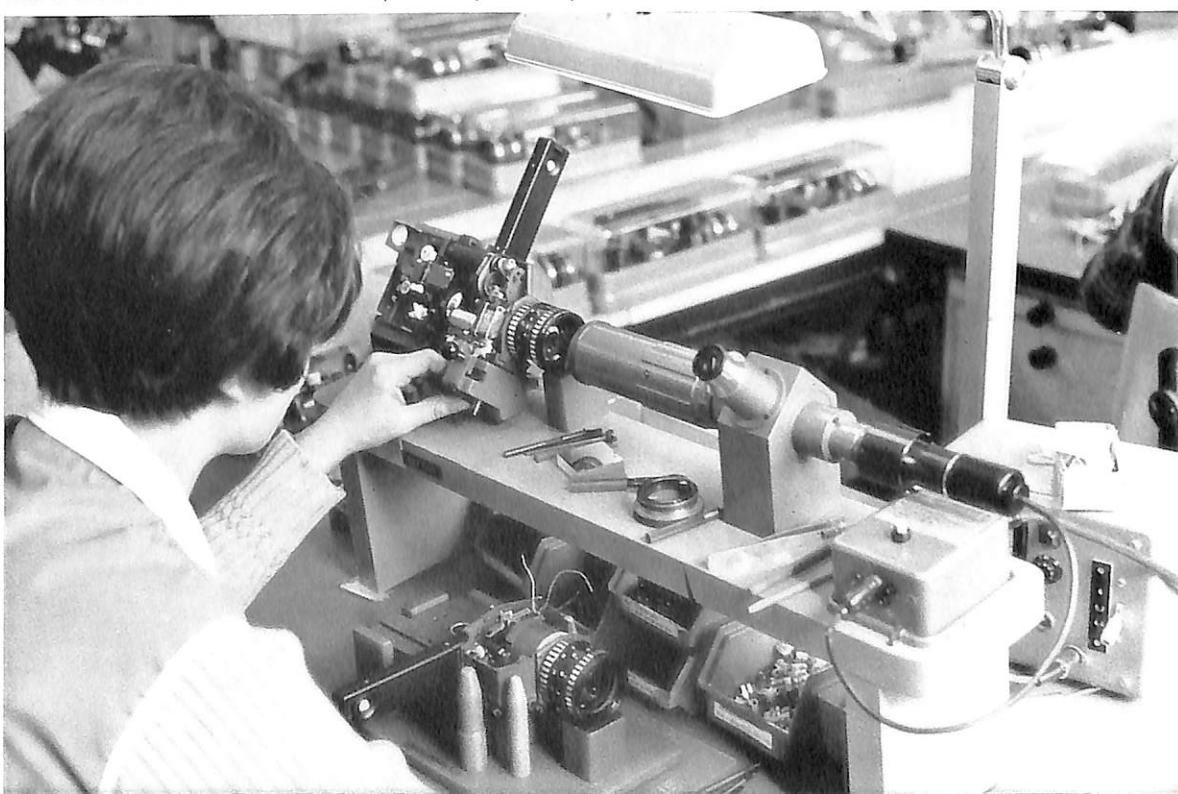


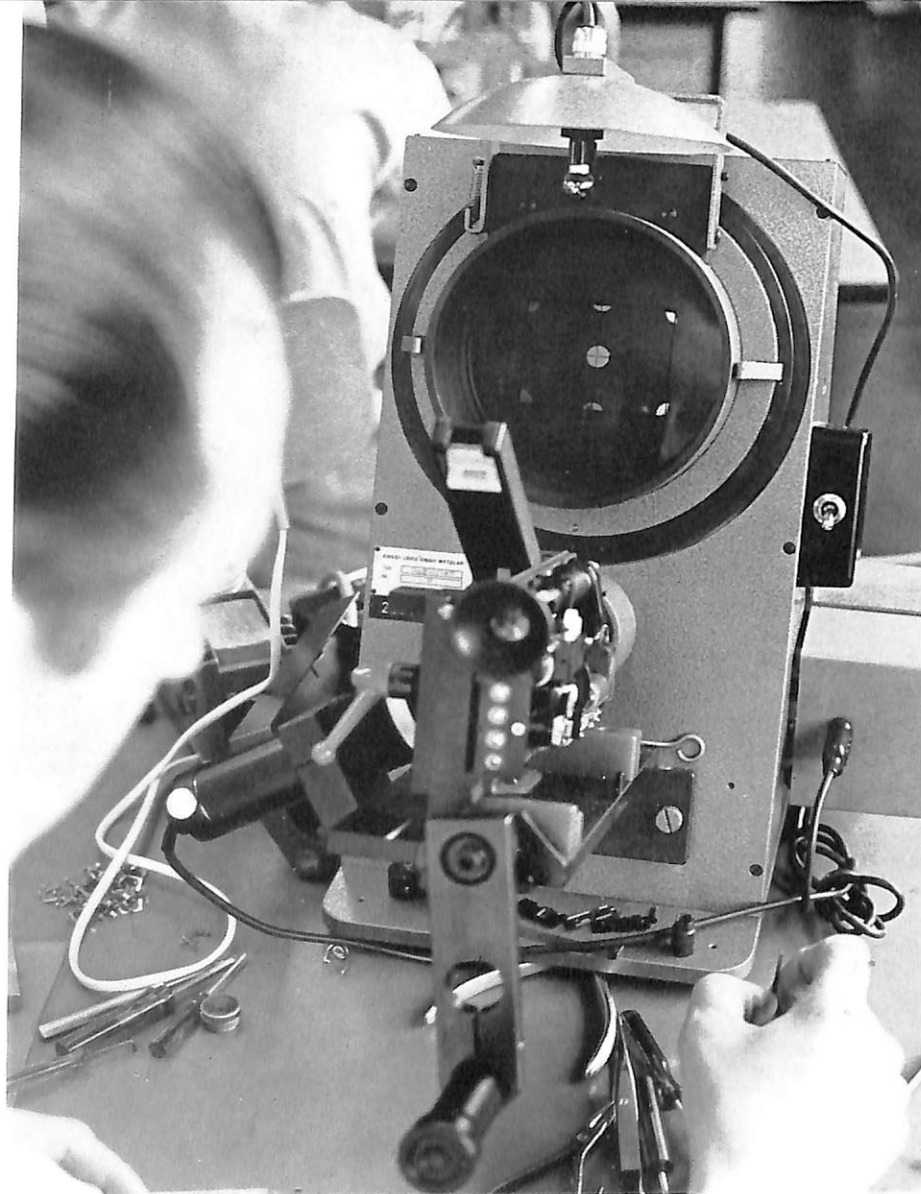
Wiring the Leicina Super's electronic innards: note Leitz-made printed-circuit board.

left at its click-stopped "O" setting which corresponds to the Super-8 film's rated ASA/DIN speed index. But skilled photographers, and the wizards of Wetzlar, know that there are times when these ratings don't provide the best results.

When filming in brightly sunlit snow or sand, or out on open water, color reversal films like Kodachrome or Agfachrome want a bit more exposure than that indicated by an averaging meter. Under such circumstances, average subjects can be greatly im-

Skilled Leitz technician using a specially constructed precision auto-collimator to set perfect lens-to-film distance in order to ensure optimum optical sharpness.





This special Leitz-made instrument is used to adjust the Leicina Super's film-gate and view-finder screen so that the finder image will be exactly centered on the film.

Here, technician makes final film-gate adjustment so that it corresponds with camera's view-finder screen, which is an air-tight encapsulated assembly to keep dust out.



proved by clicking this dial half a stop in the "+" direction, which indicates overexposure. Should the important subjects be considerably darker than the surrounding area of snow, sand, or water brightness, two clicks for a full stop over may be advisable.

Conversely, the "-" setting for one half or one full stop underexposure are extremely useful for increasing color saturation, introducing darker moodiness, or dealing with a setting sun when a foreground silhouette effect is wanted. In bright sunlight, open landscapes and other nature scenes usually respond better with a half-stop minus correction.

The Leicina Vario zoom lens provides continuous focal lengths from 8- through 64-mm, apertures from f/1.9 through f/22. This eight-to-one zooming ratio provides diagonal fields across the 4.01 x 5.36 mm Super-8 projection format from about 45.3 to 6 degrees. In terms of the 24x36-mm format of Leica and Leicaflex cameras, this corresponds to a zoom range from 50- to 400-mm.

At its closest focusing distance of three feet (0.9 m), and a 64-mm focal setting, this lens covers a field just a bit smaller than 2 x 2.5 inches (47x 63-mm). When its supplementary close-up lens (No. 22 003 in the Leitz catalog) is used, this ciné macroman-ship extends down to a format-filling field of only 0.67 x 0.87 inches (17x 22-mm) at the maximum focal setting of 64-mm, and to 4.8 x 6.4 inches (122x162-mm) at the 8-mm minimum.

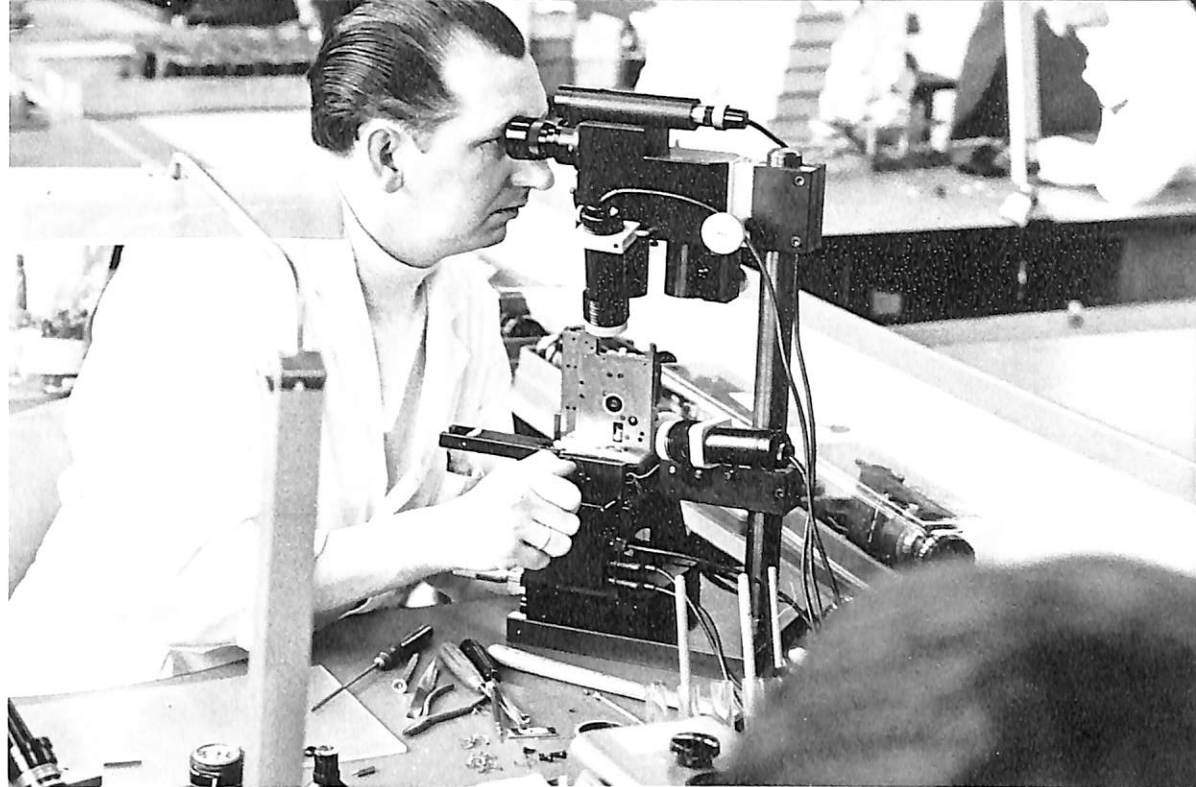
Motorized zooming is controlled by a see-saw switch on the top deck, just forward of the two much-discussed white-and-black exposure control buttons. Even this can be adjusted to individual preferences via a zooming speed control dial on the left-hand side of the camera, just under its nameplate. This dial gives a slow zooming rate indicated by one black dot, and a twice-as-fast movement indicated by two dots, with the word "ZOOM" now appearing upside down. According to the instruction manual, these rates for going from 8- to 64-mm, or vice versa, should be eight seconds at slow, four at fast, but

our two test cameras made this movement in a bit less than six and three seconds, respectively, even with well-worn batteries. If you're the type who likes to zoom with the film running—perish forbid!—the slow rate is preferable. The fast motor zoom is very handy for the filmer who wants to jump back and forth between the 64-mm focal setting for precise focusing, and the wider-angles short settings for actual filming. Again, there's an additional option: if you want, you can zoom by hand. All of these electrical functions—film-drive, exposure control, and motor-zooming—are powered by the same set of five 1.5-volt, size "AA" penlight cells. An external battery-test indicator on the right-hand side of the camera has a simple white-for-good, red-for-bad-scale.

Accurate focusing is facilitated by split-image focusing wedges centered in the Leicina Super's finder screen. These wedges have been oriented along the format diagonal so that the camera need never be tilted to find a vertical subject line. All of the "test-people" who worked with our two test-cameras commented favorably on the focusing wedges, some maintaining that they were even able to focus in the 8-mm focal setting.

The viewfinder eyepiece is adjustable for personal eyesight variations over a range of plus-or-minus two diopters, and its 18-mm pupillary distance offers even eyeglass wearers a comfortable view of the full viewfinder field. For tripod work, and other remote applications in which the user's head isn't present to close off the eyepiece against incoming light, a shutter is provided.

The Leicina Super viewfinder is an "information center," showing the aperture setting in an open arc directly below the picture field, and the amount of film left in the Super-8 cartridge on a vertical "thermometer" at the left-hand side. When the lens is zoomed past its 22-mm focal setting, a white triangle appears above the picture field to indicate that a tripod should be used, as well as that focus should be critical.



A special Leitz vertical alignment microscope is used to look backward through the open camera in order to adjust the film-transport claw position in three planes.

Hiding beneath a hinged, black coverplate on the camera's top deck is a nine-point electrical receptacle accepting a remote-control unit. This device makes possible time-lapse photography in the form of either single-frame exposures or short scenes of 0.2 sec to 10 sec duration, at preset intervals of between 0.15 sec and 6 minutes. In addition, these contacts permit

electronic-flash synchronization for single frame exposures, as well as sound synchronizing impulses for a tape recorder.

A precision instrument in the Leitz tradition, the Leicina Super combines the complete simplicity of operation wanted by the beginner with many of the optional controls needed by advanced filmers.



Leicaflex[®] SL

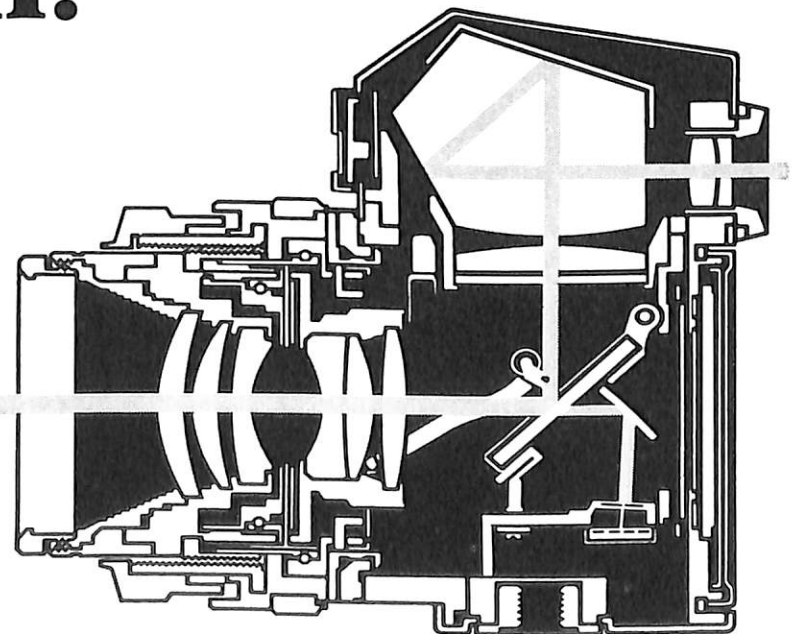
...it's
switching
the "pros"
on!

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